Abstract

A payload design for a multi-spot-beam satellite communication system includes a plurality of uplink spot beam receivers and downlink spot beam transmitters, and a broadcast transmitting subsystem capable of transmitting a broadcast beam to an entire system geographical service area. An input filter-switch-matrix (IFSM) controllably selects input IF signal bands for routing to an on-board digital signal processor-router (DSPR). The DSPR subsequently routes all received point-to-point and broadcast data packets to the appropriate downlink spot or broadcast transmitting subsystems for transmission thereof. The broadcast downlink allows broadcast transmissions to occur at the highest efficiency possible, while also allowing for flexible provision of surge capacity for point-to-point transmissions on previously exhausted spot beams by selective use of the broadcast beam for such point-to-point transmissions.